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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,023	09/15/2003	Bookeun Oh	Q176-US1	2548

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/663,023	OH ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-34,63 and 64* is/are pending in the application.

4a) Of the above claim(s) *3,4,6 and 8-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,14-34,63,64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4-9-04,4-29-04,5-19-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 4, 6 and 8-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on October 11, 2006.

Response to Amendment

2. Claims 7 and 35-62 have been cancelled. Claims 63 and 64 are new. Claims 4, 6 and 8-13 are withdrawn. Claims 1-3, 5, 14-34, 63 and 64 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 112

3. Claim 19 recites the limitation "[EO]/[Li]". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 3, 18, 20-25, 30-32 rejected under 35 U.S.C. 102(e) as being anticipated by Kang et al. (US Patent 6,783,897).

Kang et al. teach a cross-linkable solid polymer electrolyte for lithium-polymer secondary batteries (abstract).

Kang et al. teach a cross-linking agent, used to increase the compatibility between a plasticizer, such as a polyalkylene oxide, polymethyl siloxane with alkylene oxides or nonaqueous polar solvent and a lithium salt (column 3 lines 1-67; column 4 lines 1-28 and 31-36).

Kang et al. teach that the plasticizer may be a polyalkylene glycol dialkyl ether, such as polyethylene glycol dimethyl ether (column 8 lines 65-67).

Examples of the lithium salt include $LiClO_4$, $LiCF_3SO_3$, $LiBF_4$, $LiPF_6$, $LiAsF_6$, $Li(CF_3SO_2)_2N$ (column 9 lines 13-18).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 5, 14, 63 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. in view of Zhang et al. (Cross-Linked Network Polymer Electrolytes).

The teachings of Kang et al. as discussed above are incorporated herein.

Kang et al. teach the use of a polymethyl siloxane with alkylene oxides in a polymer electrolyte for a lithium battery but fail to teach Formula I of the claimed invention.

Zhang et al. teach cross-linked polysiloxane network polymer electrolyte with pendant oligo-(ethylene glycol) groups as internally plasticizing chains. The polysiloxane of Zhang et al. has very high conductivity at room temperature (p. 9176, top of second column).

Scheme 2 of Zhang et al., found on page 9177, shows the polysiloxane molecule of the instant invention. Zhang et al. also teach the end units (p. 9177, bottom of first column). Zhang et al. teach that their solid polysiloxane polymers enhance the ionic conductivity of the network polymer electrolytes (p. 9173, first full paragraph).

It would have been desirable to use the polymers of Zhang et al. in the polymer electrolyte of Kang et al. in order to enhance the ionic conductivity of the network polymer electrolyte.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polymers of Zhang et al. in the polymer electrolyte of Kang et al. in order to enhance the ionic conductivity of the network polymer electrolyte.

As for claim 14, the polyethylene glycol dimethyl ether is taught by Kang et al. (see above).

Regarding claim 64, Kang et al. in view of Zhang et al. teaches the claimed invention except for the value of "p". It would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment to find the most effective value for p, since Zhang et al. teach varying the value leads to variations in conductivity (see Table 1). It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05(II B).

8. Claims 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al.

The teachings of Kang et al. as discussed above are incorporated herein.

Regarding claim 15, Kang et al. teach that a plasticizer with a low molecular weight is added to the polymer electrolyte (column 2 lines 46-54) but fail to disclose the claimed range. It would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment to find the most effective molecular weight, since Kang et al. teach that molecular weight of the plasticizer affects ionic conductivity. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05(II B).

As for claims 16, 17 and 19, Kang et al. teach various ranges for the amounts of each component in the electrolyte (i.e. column 9 lines 13-18), but fail to disclose the exact ranges claimed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment to find the most effective amounts of each component in the electrolyte, since the relative amounts of the components

determine the ionic conductivity of the electrolyte (Tables 3-7). It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05(II B).

9. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. in view of Munshi (US Patent 6, 413, 676).

The teachings of Kang et al. as discussed above are incorporated herein.

Kang et al. fail to teach a polyacrylate or polymethacrylate network polymer.

Munshi teaches polymethacrylate for use in a polymer blend in a solid polymer electrolyte, since this creates a highly stable, resilient electrolyte for use in a lithium battery (abstract; column 11 lines 18-29).

It would be advantageous to use a polymethacrylate as taught by Munshi in the solid electrolyte of Kang et al. since it creates a highly stable, resilient electrolyte for use in a lithium battery.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a polymethacrylate as taught by Munshi in the solid electrolyte of Kang et al. since it creates a highly stable, resilient electrolyte for use in a lithium battery.

10. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. in view of Hanson et al. (US Pre-Grant Publication 2001/0001053).

The teachings of Kang et al. as discussed above are incorporated herein.

Kang et al. teach a lithium battery with the electrolyte of the claimed invention but are silent on the anode and cathode materials. Since the battery is a lithium battery, it inherently would have a lithium-based anode.

Hanson et al. teach a lithium battery having an anode and cathode. Hanson et al. teach that a typical anode for a lithium battery is a lithium material, while a metal oxide such as lithiated vanadium is used for the cathode.

It would be desirable to use the anode and cathode materials of Hanson et al. in the battery of Kang et al. since it is taught by Hanson et al. that those materials are typically used to generate electricity and transfer ions in a lithium battery and since Kang et al. does not disclose specific materials for the electrodes.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the anode and cathode materials of Hanson et al. in the battery of Kang et al. since it is taught by Hanson et al. that those materials are typically used for the electrodes and since Kang et al. does not disclose specific materials for the electrodes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee

MARK RUTHKOSKY
PRIMARY EXAMINER

12.21.2006